

## Two Species of the Genus *Bodotria* (Cumacea, Bodotriidae) from Korea

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### ABSTRACT

This study on Korean cumaceans was based on the specimens collected from Kōjedo I. and Chejudo I. in Korea. Two species in the Genus *Bodotria* (Bodotriidae) were identified: *B. biplicata* Gamô, 1964 and *B. carinata* Gamô, 1964. They are redescribed and illustrated as new records to Korean fauna. Especially, male of *B. carinata* is described at first on the basis of the specimen from Korean waters. As a result, Korean cumacean fauna consists of 10 species of five genera in three families.

Key words: Redescription, *Bodotria*, Bodotriidae, Cumacea, Crustacea, Korea.

### INTRODUCTION

The study on Korean cumaceans was first carried by Calman (1911) who reported two new species, *Campylaspis orientalis* and *Diastylis koreana*, belonging to family Nannastacidae and Diastylidae respectively, based on specimens collected from adjacent sea in Korea. Since then, Kang and Lee (1995a, b) reported five species belonging to two families (Diastylidae and Bodotriidae) which were new to Korean waters: *Dimorphostylis asiatica*, *D. valida*, *D. acroplicata*, *Bodotria similis* and *Vaunthompsonia cristata*. Also, Kang and Lee (1996) reported a new species, *Diastylis paratricinta*, belonging to family Diastylidae. By these previous studies, total eight cumacean species of five genera in three families were known to Korea.

During the continuous taxonomic study on Korean cumaceans, we investigated cumacean specimens collected from Kōjedo I. and Chejudo I. in Korea from May 1994 to June 1995. Two species of them were identified as *Bodotria biplicata* Gamô, 1964 and *B. carinata* Gamô, 1964

which are new to Korean fauna. Of these, *B. carinata* was originally described only by female from the Japanese waters (Gamô, 1964a). Still the information about its male was not known. Fortunately, we collected many male specimens of *B. carinata* from Chejudo I. In this paper, we describe the male of *B. carinata* with illustrations and redescribe *B. biplicata* from Korean waters. The specimens were collected by a light-trap at night. Drawings and measurements were performed with the aid of the drawing tube. All specimens examined are deposited in the Department of Biology, Dankook University.

## DESCRIPTIONS

Order Cumacea Kröyer, 1846 올챙이새우 목

Family Bodotriidae Scott, 1901 참올챙이새우 과

Subfamily Bodotriinae Hale, 1944 참올챙이새우 아과

Genus Bodotria Goodsir, 1843 참올챙이새우屬

***Bodotria biplicata* Gamô, 1964** 곰보두줄참올챙이새우 (신칭)

*Bodotria* sp. Gamô, 1963, p. 80, pl. 15, fig. 23.

*Bodotria biplicata* Gamô, 1964b, p. 241, figs. 1-2.

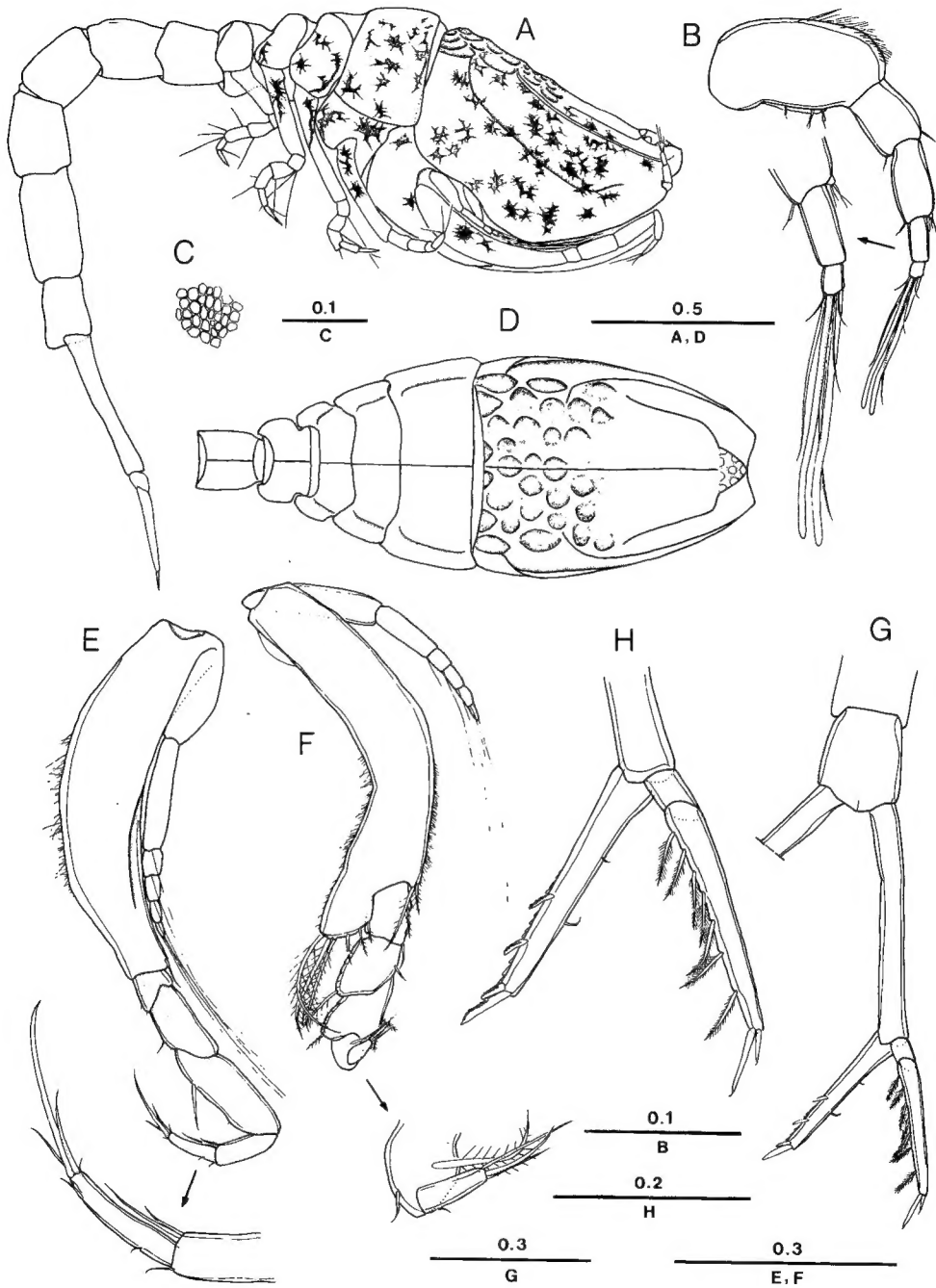
**Material examined.** 1 ♀, Kōjedo I. (Wahyōn), 27 Jun. 1995, B.J. Kang.

**Adult female:** Body (Fig. 1A) about 2.48 mm long, excluding pseudorostrum and uropod; its integument (Fig. 1C) calcified and covered with minute netlike patterns. Body surface (Fig. 1A) furnished with scattered dark pigments. Carapace (Figs. 1A, D) slightly longer than 1/3.5 of total length of body, nearly 1.3 times as long as its width and 1.8 times as long as its depth. Postero-dorsal surface of carapace (Figs. 1A, C, D) coarsely reticulated and pitted. Dorso-median carina (Figs. 1A, D) well marked over whole length of carapace and 2 pairs of lateral (upper and lower) longitudinal ridges furnished with on each side; both somewhat curved, almost parallel to one another. Upper and lower ridges not reached at posterior margin of carapace; each ridge unconnected with each other in dorsal portion. Antennal notch and antero-lateral angle prominent. Pseudorostral lobes (Fig. 1D) broadly truncated and meted in front of ocular lobe. Ocular lobe subtriangular and with 8 ocelli.

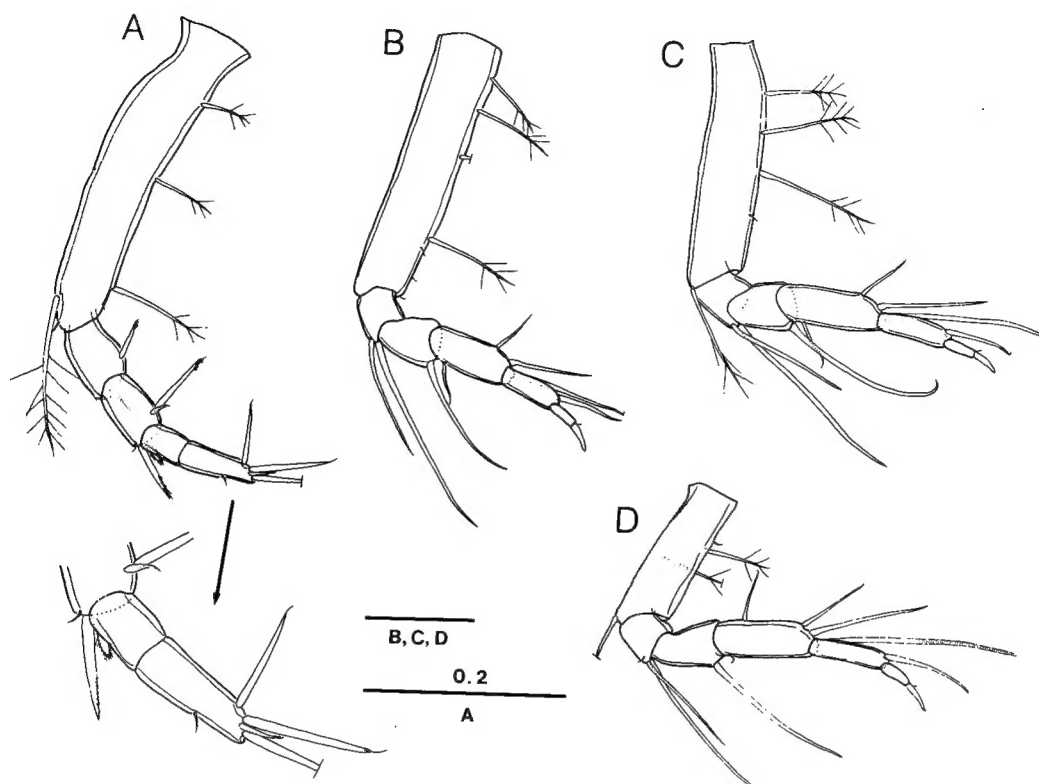
All free thoracic somites (Figs. 1A, D) shorter than carapace and about 1/4 of body length. First somite very short. Second somite larger than others, slightly shorter than third and fourth somites combined. Abdomen (Fig. 1A) rather slender and nearly 0.83 times as long as cephalothorax. Fifth somite longer than others.

Antennular peduncle (Fig. 1B) 3-segmented; first segment nearly 1.16 times as long as remaining distal 2 segments; third segment nearly 1.33 times as long as second segment. Main flagellum 2-segmented and with 2 subequal aesthetascs. Accessory flagellum very minute.

Basis of third maxilliped (Fig. 1F) about 1.56 times as long as remaining distal segments; inner and outer margin with many hairs. External angle of basis very inflated, reaching to about 1/3 of merus and with 6 plumose setae; internal angle with 2 plumose setae. Ischium, merus and carpus subequal. Propodus nearly 0.68 times as long as carpus. Dactylus nearly 0.83 times as long as propodus.



**Fig. 1.** *Bodotria biplicata* Gamô, 1964, Female: A, lateral view of body; B, antennule; C, integument of carapace; D, cephalothorax, dorsal; E, first pereopod; F, third maxilliped; G, uropods, telson and last abdominal somite; H, exopod and endopod of uropod. (unit of scales in mm)



**Fig. 2.** *Bodotria biplicata* Gamô, 1964, female: A, second pereopod; B, third pereopod; C, fourth pereopod; D, fifth pereopod. (unit of scales in mm)

Basis of first pereopod (Fig. 1E) nearly 1.2 times as long as remaining distal segments. Ischium shorter than half of merus. Carpus nearly 2.25 times as long as merus. Propodus nearly 0.65 times as long as carpus. Dactylus subequal in length to propodus. Basis and ischium of second pereopod (Fig. 2A) fused and nearly 1.34 times as long as remaining distal segments. Dactylus nearly 1.84 times as long as propodus, with 3 large spines and a small spine on distal end. Basis of third pereopod (Fig. 2B) nearly 1.04 times as long as remaining distal segments. Basis of fourth pereopod (Fig. 2C) nearly 0.82 times as long as remaining distal segments. Basis of fifth pereopod (Fig. 2D) nearly 0.47 times as long as remaining distal segments.

Peduncle of uropod (Fig. 1G) slender and nearly 2.38 times as long as last abdominal segment. Endopod of uropod (Figs. 1G, H) unsegmented, serrated on inner border, about 3/5 of length of peduncle and furnished with 2 inner spines and 2 terminal spines. Exopod of uropod 2-segmented, slightly longer than length of endopod; first segment about 1/5 of length of second one; second segment furnished with 7 inner plumose setae and 2 terminal spines (one long and the other short).

**Remarks.** Our specimen is well accorded with the original description (female) of *Bodotria biplicata* by Gamô (1964b) from Japan waters. The present species has in general following

features in female: 1) two lateral ridges are almost parallel to one another; 2) they are not reached at the posterior margin of carapace; 3) each ridge is unconnected with each other in the dorsal portion; 4) also, this portion is coarsely reticulated and deeply pitted. It seems that these are important characters of this species. However, the several geographical variations were found between ours and Gamô's specimen (female). Our specimen appears that the peduncle of uropod is 2.38 times as long as the last abdominal segment, while its length is 2.5 times as long as the last abdominal segment in the original description. Also, in Gamô's specimen, the exopod of uropod is serrated on both borders, while our specimen is not. In our specimen, the second segment of exopod of uropod is furnished with 7 plumose setae on the inner border, while it is furnished with 6 ones in the original description. There are pitting patterns on the postero-dorsal surface of carapace and second thoracic somites in Gamô's specimen, but they are appeared only on the carapace in ours.

**Distribution:** Korea (Kôjedo I.), Japan (Sado I.).

***Bodotria carinata* Gamô, 1964** 네모참을챙이새우 (신칭)

*Bodotria* sp. Gamô, 1960, p. 118, pl. 59, fig. 1.

*Bodotria carinata* Gamô, 1964a, p. 22, figs. 3-4.

**Material examined.** 60 ♂ ♀, Chejudo Is. (Sôngsanp'o), 7 May 1994, B.J. Kang.

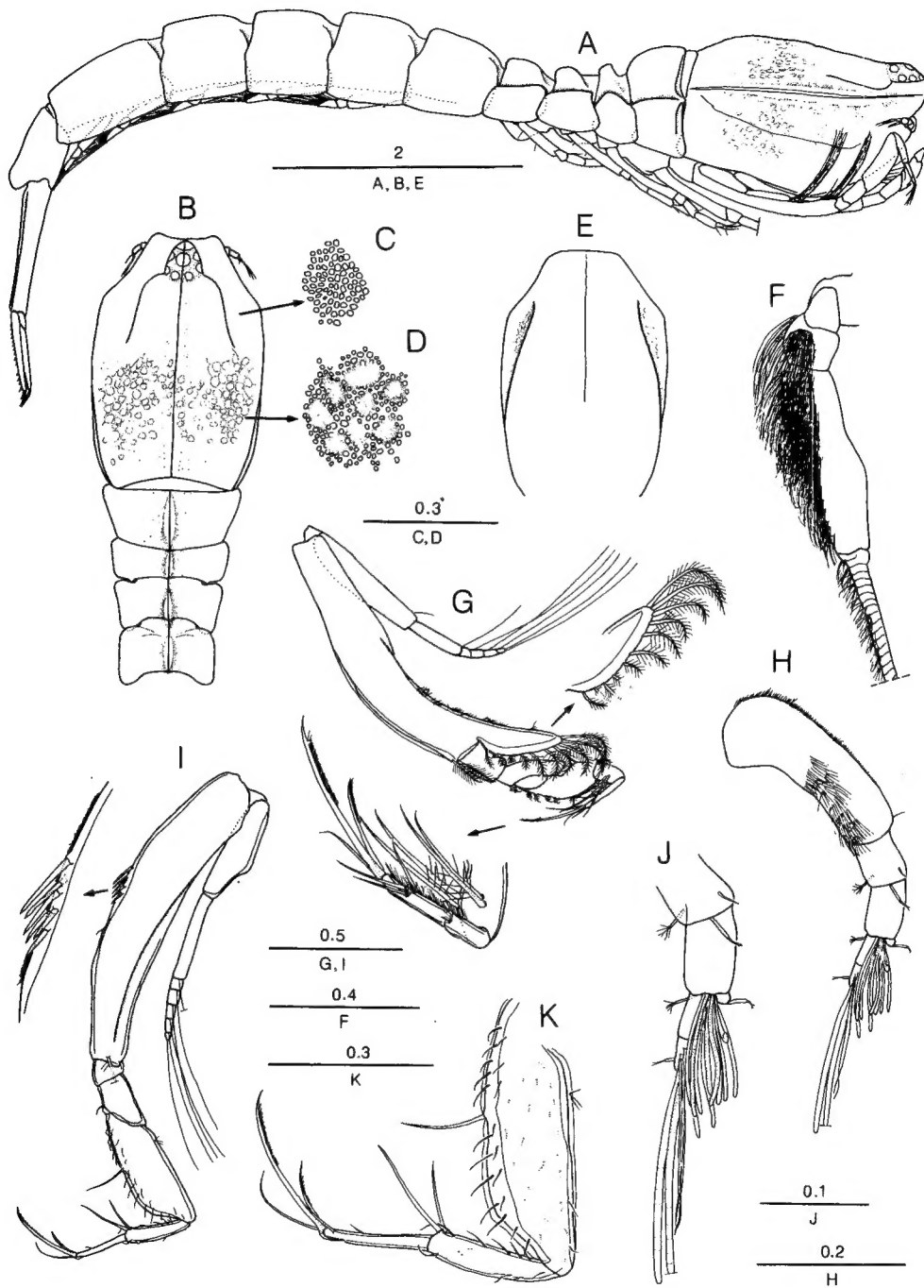
**Adult male:** Body (Fig. 3A) about 7.7 mm long, excluding pseudorostrum and uropod; its integument (Figs. 3B, C) well-calcified, hard and covered with minute netlike patterns. Shape of carapace (Figs. 3B, E) almost quadrangular. Carapace (Figs. 3A, B) about 1/4 of total length of body, nearly 1.4 times as long as its width and 1.62 times as long as its depth. Postero-dorsal surface of carapace (Figs. 3C, D) minutely reticulated and weakly pitted. Dorso-median carina (Figs. 3A, B) well-marked over whole length of carapace. Well-developed dorso-lateral carina laterally expanded and a pair of indistinct lateral oblique ridges furnished with on each side. Antennal notch and antero-lateral angle prominent. Pseudorostral lobes (Fig. 3B) broadly truncated and meet in front of ocular lobe. Ocular lobe subtriangular and with 8 ocelli.

All free thoracic somites (Figs. 3A, B) shorter than carapace and about 1/5 of body length. Dorso-median carina elevated and dorso-lateral carina well-marked on all somites. First somite very short and only exposed as a narrow strip. Second somite larger than others, slightly shorter than third and fourth somites combined. Abdomen very plump and nearly 1.25 times as long as cephalothorax. Fifth somite longer than all others. Sixth somite slightly shorter than 3/4 of length of fifth.

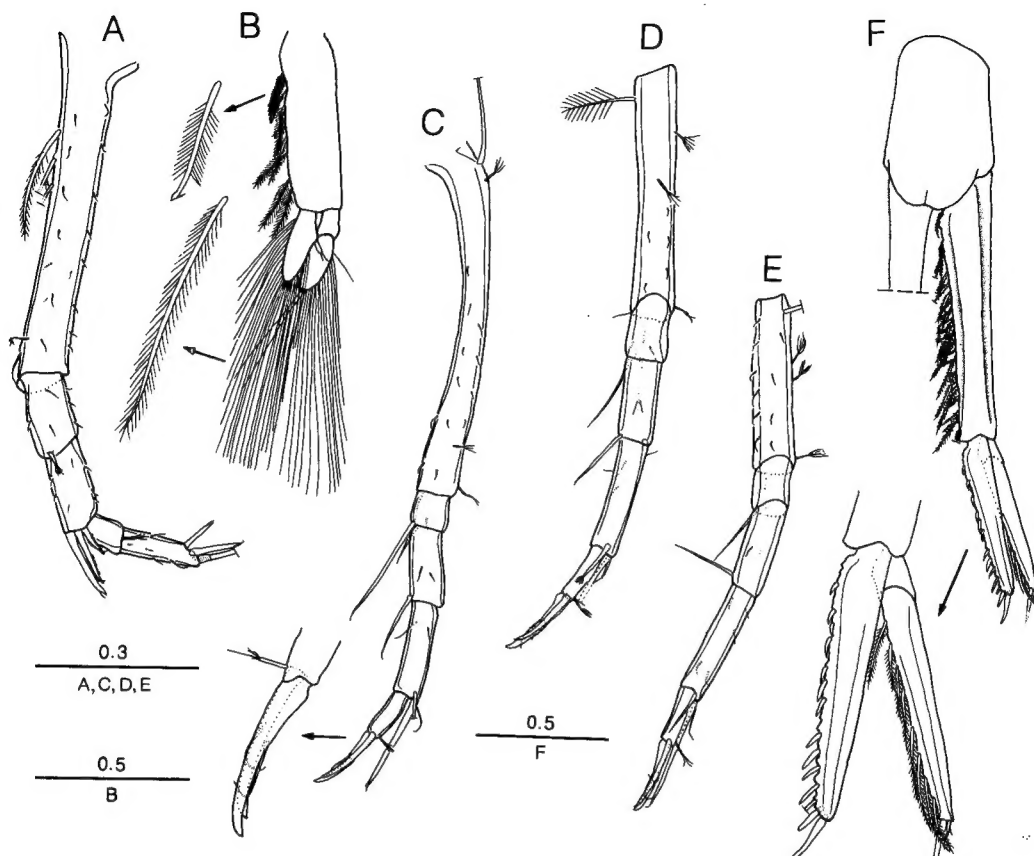
Antennular (Fig. 3H, J) peduncle 3-segmented; first segment nearly 1.95 times as long as remaining distal 2 segments; third segment nearly 1.18 times as long as second segment, with group (approximately 10) of small aesthetascs. Main flagellum 2-segmented, with 2 subequal aesthetascs and 2 long setae. Accessory flagellum very minute.

Flagellum of antenna very long, extending beyond last abdominal somite; its peduncle furnished with many rows of numerous sensory hairs.

Basis of third maxilliped (Fig. 3G) nearly 1.33 times as long as remaining distal segments. External angle of basis very inflated, reaching to about 2/3 of merus and with approximately 11 plumose setae; internal angle with 2 plumose setae. Ischium and merus subequal. Carpus nearly 1.4 times as long as ischium. Propodus about 1/2 of length of carpus. Dactylus nearly 1.44 times as long as



**Fig. 3.** *Bodotria carinata* Gamô, 1964, male: A, lateral view of body; B, cephalothorax, dorsal; C, anterior integument of carapace; D, posterior integument of carapace; E, cephalothorax, ventral; F, antenna; G, third maxilliped; H, antennule; I, first pereopod; J, terminal portion of antennule; K, terminal portion of first pereopod. (unit of scales in mm)



**Fig. 4.** *Bodotria carinata* Gamô, 1964, male: A, second pereopod; B, first pleopod; C, third pereopod; D, fourth pereopod; E, fifth pereopod; F, uropods, telson and last abdominal somite. (unit of scales in mm)

propodus.

Basis of first pereopod (Fig. 3I) nearly 1.09 times as long as remaining distal segments, with 6 spines on middle of inner border. Ischium shorter than half of merus. Carpus somewhat dilated laterally, nearly 2.5 times as long as merus; its width about  $3/7$  of length; its inner margin with a long seta at middle part and numerous short setae. Propodus slightly longer than half of carpus. Dactylus nearly 0.84 times as long as propodus.

Basis and ischium of second pereopod (Fig. 4A) fused and nearly 1.12 times as long as remaining distal segments. Merus subequal to carpus. Dactylus nearly 2.18 times as long as propodus, with 3 large spines and a small spine on distal end. Basis of third pereopod (Fig. 4C) nearly 1.23 times as long as remaining distal segments. Basis of fourth pereopod (Fig. 4D) nearly 0.68 times as long as remaining distal segments. Basis of fifth pereopod (Fig. 4E) nearly 0.45 times as long as remaining distal segments.

Basis of first pleopod (Fig. 4B) nearly 2.14 times as long as outer ramus, with 11 short plumose setae on inner border and end of 5 proximal plumose setae of them round; Outer ramus 2-segmented; inner ramus unsegmented, about  $7/8$  of outer one; both rami with numerous long

plumose setae.

Peduncle of uropod (Fig. 4F) thick and strong, nearly 1.48 times as long as last abdominal segment; its inner border furnished with numerous plumose setae. Endopod of uropod unsegmented, serrated on inner border, about  $2/3$  of length of peduncle and furnished with approximately 12 inner spines and 2 terminal spines. Exopod of uropod 2-segmented, subequal in length to endopod; first segment about  $1/6.5$  of length of second one; second segment furnished with approximately 8 inner plumose setae and 2 terminal spines (one long and the other short).

**Remarks.** This species was described only by one female specimen from the Japanese waters (Gamô, 1964a), therefore its male was not known until now. Fortunately, we collected many male specimens of *Bodotria carinata* Gamô, 1964 from Korean waters, but unfortunately without female. However, we could conclude that those are the same species having with the following features in common: 1) the postero-dorsal surface of carapace is minutely reticulated and pitted; 2) on each dorso-lateral side there is a well-developed dorso-lateral carina which is greatly expanded, consequently the shape of carapace is almost quadrangular from dorsal view; 3) a pair of indistinct lateral oblique ridges are furnished with on the each side of carapace (Gamô didn't mention them in the original description); 4) the carpus of first pereopod is distinctly more dilated than that of other congeners. These characters allowed us to identify our specimens as *B. carinata*. Some differences between both sexes were also found: 1) the ocular lobe of female is beset with 10 ocelli, while that of male is beset with 8 ones; 2) in female, the endopod of uropod is furnished with 10 inner spines, while that of male is furnished with 12 ones.

**Distribution:** Korea (Chejudo I.), Japan (off Manazuru).

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한국産 참울챙이새우屬(울챙이새우目, 참울챙이새우科)의 2미기록종

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#### 요 약

거제도와 제주도에서 채집된 울챙이새우類를 동정한 결과 *Bodotria*(참울챙이새우)屬에 속하는 2 한국미기록종인 *B. biplicata* Gamô, 1964와 *B. carinata* Gamô, 1964가 확인되어, 각각 곰보두줄참울챙이새우와 네모참울챙이새우로 명명하여 보고한다. 특히, *B. carinata*의 수컷에 관한 기재는 학계에 처음으로 보고되는 것이다. 이로써 한국産 울챙이새우類는 총 3과 5속 10종이 된다.